Reviewer's report

Title: Computerized acoustic assessment of treatment efficacy in RSV Bronchiolitis: Nebulized Epinephrine Versus Albuterol- a double-blind study.

Version: 1 Date: 17 July 2006

Reviewer: Hans Pasterkamp

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General

This is an interesting study that compares objective and automated analysis of respiratory sounds in bronchiolitis with subjective clinical scoring of disease severity and response to treatment. Presumably the sound recording also provides an automated count of respiratory rate. The only difference then to the clinical score, aside from oxygen saturation, is the parameter of "dyspnea" (an incorrect term in this context because dyspnea refers to the subjective experience of difficult breathing which would have to be reported by the patient). I presume that "visible respiratory distress" is meant here, most likely categorized by the severity of retractions. Since this may also be objectively quantified, e.g. by thoraco-abdominal asynchrony, one can see the potential for clinical-physiologic monitoring systems that include respiratory acoustic analyses.

Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

Please state your hypothesis. I don't think that you were testing whether treatment with albuterol or epinephrine is effective in bronchiolitis. Rather, you used these treatments to test whether automated quantification of wheezing and crackles can replace the subjective scoring of these respiratory sounds.

Please explain the sample size calculation for this pilot project. If proving your hypothesis is essential to moving forward with the clinical application of the new technique, a biostatistician should confirm the appropriate study design and choice of comparisons. This may involve tests of observer agreement, i.e. PulmoTrack against clinician, that differ from the group-wise comparisons that you employed.

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

Please provide the clinical score in detail, e.g. what does dyspnea of 0 to 3 mean and how is SaO2 assigned to those categories?

You describe the acoustic sensors in detail but not the sampling frequency and bit rate. You cite the validation of the accuracy of wheeze detection (Ref.25) but you do not provide details regarding the automated detection, characterization and quantification of crackles. Was this published?

Please provide the total number of patients with bronchiolitis admitted during the study period. How many did you have to exclude and for what reasons?

You mention the design of the recording setup that minimizes external noise interference. What were the interferences that overcame the noise rejection and shielding techniques? What was the proportion per recording that had to be excluded because of these interferences? Were interferences detected automatically or by subjective listening? How much time did it take to edit and select the 20 breaths?

Please explain the crackle count, i.e. do the numbers refer to crackles per breath? per complete breath or per inspiration only? per 20 breaths?

I find your Table 1 entries confusing. Does 5/7 in the entry of maternal smoking among the adrenaline group mean 5 mothers smoked and 7 did not? The way it is written it reads like "5 of 7". The same applies to other entries in the Table.
Check Figure 3. I don't think this is what you intended here because it shows pH probe data that were not part of this study.

Discretionary Revisions (which the author can choose to ignore)

Children in both treatment arms of your study group had low wheeze counts, i.e. on average less than 10% Tw/Ttot, much lower than the 47% Tw/Ttot in the responders of Asher Tal's study. Please address this in the discussion.

What next?: Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: Yes

Declaration of competing interests:

I declare that I have no competing interests.